DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

50 CFR Part 222

[Docket No. 910379–1256]

RIN 0648–AD90

Endangered and Threatened Species; Endangered Status for Snake River Sockeye Salmon

AGENCY: National Marine Fisheries Service (NMFS), NOAA, Commerce.

ACTION: Final rule.

SUMMARY: NMFS has determined that the Snake River sockeye salmon (*Oncorhynchus nerka*) is a "species" under the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 *et seq.* (ESA) and should be listed as endangered. The Snake River sockeye salmon has declined to extremely low numbers. Current production is limited to Redfish Lake in the Salmon River Basin, Idaho. Hydropower development, water withdrawal and diversions, water storage, harvest, predation, and inadequate regulatory mechanisms are factors contributing to the species' decline and represent a continued threat to the Snake River sockeye salmon's existence.

In a separate rulemaking, the U.S. Fish and Wildlife Service (FWS), Department of the Interior, will add the Snake River sockeye salmon to the U.S. List of Endangered and Threatened Wildlife.

EFFECTIVE DATE: December 20, 1991.

FOR FURTHER INFORMATION CONTACT: Rob Jones, NMFS, Environmental and Technical Services Division, 911 NE 11th Avenue, room 620, Portland, OR 97232, telephone (503) 230–5429 or FTS 230–5429, or Patricia Montanio, NMFS, 1335 East-West Highway, Silver Spring, MD 20910, telephone (301) 427–2322.

SUPPLEMENTARY INFORMATION:

Background

NMFS initiated a status review of sockeye salmon (*Oncorhynchus nerka*) in the Salmon River, a tributary of the Snake River, on April 9, 1990 (55 FR 13181). NMFS also received a petition (April 2, 1990) from the Shoshone-Bannock Tribes of the Fort Hall Indian Reservation to list Snake River sockeye salmon as endangered under the ESA. NMFS published a notice on June 5, 1990 (55 FR 22942), that the petition presented substantial scientific information indicating that the listing may be warranted and requested information from the public.

NMFS prepared a technical paper "Status Review Report for Snake River Sockeye Salmon" (Waples *et al.* 1991) and published a proposed rule (April 5, 1991; 56 FR 14055) for listing Snake River sockeye salmon as an endangered species; comments were requested. This final rule is based on the status review and on comments received on the status review and proposed rule.

Summary of Comments

One hundred and eighty-three written comments were received on the proposed rule. NMFS considered all comments received, including oral testimony from public hearings on the proposal to list Snake River sockeye salmon. The vast majority of comments supported the proposal. Opposition to the proposed rule was primarily based on consideration of Snake River sockeye salmon as a "species" under the ESA. Many commenters provided information pertinent to research needs and recovery planning. Although this information will be very useful in the development of a recovery plan, it will not be addressed here. Information pertinent to the listing decision has been incorporated here. A summary of major comments relevant to the listing determination is presented below.

Life History and Distribution

Some commenters believed that adult returns in recent years to the Sawtooth weir at the Sawtooth hatchery on the Salmon River near Stanley, Idaho, were returning kokanee salmon outmigrants from Alturas Lake. NMFS believes that the natural production of sockeye salmon in Alturas Lake was eliminated when agricultural diversions prevented adult sockeye salmon from reaching the lake. Adults trapped at the Sawtooth weir may have been kokanee salmon returning to Alturas or Redfish Lakes, or sockeye strays from Redfish Lake.

Consideration of Sockeye Salmon as a Species

Some commenters stated that Snake River sockeye salmon are extinct and that the anadromous *O. nerka* returning to Redfish Lake are the same as Redfish Lake kokanee. Others believed that Snake River sockeye salmon were not an evolutionary significant unit (distinct population) and, therefore, do not warrant protection under the ESA. Still others believed that additional research is needed to answer this question.

NMFS has considered available scientific evidence and continues to conclude that the two forms of *O. nerka* in Redfish Lake were historically and are currently distinct. In an attempt to clarify the relationship between Redfish Lake sockeye and kokanee salmon, NMFS initiated genetic testing. Preliminary results show that outmigrants collected from Redfish Lake Creek in the spring of 1991 are clearly different from Redfish Lake kokanee salmon sampled in the fall of 1990 (Schiewe 1991).

Juvenile Snake River Sockeye Migration

Several commenters stated that insufficient flows are the primary factor affecting downstream migrant juvenile Snake River sockeye salmon. Other commenters disagreed. Some commenters also pointed out that there are factors other than flows affecting the migration and travel time of juvenile Snake River sockeye salmon. NMFS believes that available data show that flows, in conjunction with water velocity, are important to the expeditious migration of juvenile salmon through the existing river system to the ocean. NMFS recognizes that flows and other factors affect the migration rate of juvenile salmon and that all factors must be taken into account in developing a recovery plan.

Some commenters took issue with the NMFS citation of the Columbia Basin Fish and Wildlife Authority's (CBFWA) flow proposal. NMFS did not intend that the reference imply a specific flow level is required to meet a future recovery standard.

The proposed rule identified turbine mortality as an important factor affecting the survival of sockeye salmon. Some commenters stated that the proposed rule should not imply that all other routes of passage are preferable to turbines. NMFS has reviewed available information that indicates that turbine mortality is generally higher than mortality incurred in other routes of passage.

Some commenters stated that the use of Snake and Columbia River water for irrigation is not a major factor causing the decline of Snake River sockeye salmon. NMFS did not intend that the proposed rule establish priorities regarding causes of decline. Rather, the proposed rule identified factors responsible for the decline of Snake River sockeye salmon. The storage and agricultural use of water was identified as such a factor. The rule also identified other passage and flow-related problems resulting from the presence of lower Snake River and Columbia River dams.

Some commenters were critical of the ranges and estimates of specific mortality factors presented by NMFS. NMFS is aware that other estimates of mortality for factors encountered by juvenile and adult fish migrating through the mainstem Columbia and Lower Snake River dams exist, but believes

that it used the best available information.

Habitat

Some commenters stated that the effects of habitat destruction resulting from mining, logging, road building, and grazing were understated in the proposed rule. NMFS recognizes that these activities can result in degradation of water and aquatic habitat quality. However, NMFS did not find and was not presented with evidence that these activities have adversely affected the production of Snake River sockeye salmon.

Overutilization

Commenters expressed conflicting views as to whether the harvest of Snake River sockeye salmon in the Snake and Columbia Rivers was a primary factor contributing to their decline. NMFS recognizes, as stated in the proposed rule, that historic levels of harvest greatly reduced the number of Snake River sockeye salmon and acknowledges that directed commercial harvest of sockeye salmon in the Columbia River was suspended for 1991. Although no data exist on Snake River sockeye salmon harvest specifically, the harvest of sockeye salmon in the Columbia River may be a continuing factor contributing to this population's decline.

Disease and Predation

Comments were submitted indicating that several potential disease pathogens were not addressed in sufficient detail. NMFS acknowledges that infectious hematopoietic necrosis, bacterial kidney disease, whirling disease, *Trichophyra* sp., as well as many other pathogens, can infect sockeye salmon. These pathogens were considered in the proposed rule, but their effects on Snake River sockeye salmon remain undocumented.

One commenter was concerned that a 60-percent predation rate was too low for all early life stages of Redfish Lake sockeye. NMFS agrees that this is a valid concern and further investigation indicates that this percentage should pertain only to juvenile sockeye salmon rearing in lakes. Another commenter asked for clarification of which species of salmon were examined for marine mammal bites at Lower Granite Dam. NMFS notes that these were spring chinook.

Inadequate Regulatory Mechanisms

While some commenters agreed that existing regulatory measures have not been adequate to prevent the decline of Snake River sockeye salmon, many commenters also noted instances in which existing authorities were not adequately used by NMFS and other fishery agencies due to priorities on other species. Specific comments included the role of NMFS and other fishery agencies in agreements and programs such as the Lower Snake River Fish and Wildlife Compensation Plan (LSRCP), the Idaho Power Company settlement agreement, and the Mitchell Act, which fail to provide mitigation for Snake River sockeye salmon. The 1972 LSRCP was prepared jointly by NMFS, FWS, and fisheries agencies from Idaho, Washington, and Oregon. Artificial propagation of sockeye salmon was not considered at the time the LSRCP was developed due to problems in controlling the infectious hematopoietic necrosis virus. Appropriate technology to manage the virus had not yet been developed in 1972.

One commenter also suggested that the problem was not the inadequacy of the laws but that competing user groups have not resolved water-related issues. NMFS agrees that all comments relating to regulatory mechanisms are useful in that they provide a more thorough history of events, and identify agreements and programs previously accepted by NMFS that may need to be considered in the development of a recovery plan.

Some commenters stated that the Federal Energy Regulatory Commission (FERC) licensing process provides protection for fish resources, and that the FERC license conditions associated with the Hells Canyon Complex are adequate. NMFS notes that recommendations to FERC by fisheries agencies are not always included in FERC license conditions, and FERC licenses are granted for up to 50 years, resulting in a licensing process that may not ensure protection of fish resources.

Many commenters also referred to the inadequacy of the Water Budget and other measures under the Northwest Power Planning Council's Fish and Wildlife Program. Comments on the Water Budget included additional examples of problems with both its structure and implementation. Some, for example, strongly supported statements in the proposed rule regarding the Water Budget's inadequate quantity or operational constraints. Some commenters also said that the Water Budget has not been used for sockeye salmon and has instead been focused on peak migrations of hatchery chinook salmon and steelhead trout. NMFS notes that although there is substantial overlap in the migration timing of these species, it is true that implementation has not focused specifically on Snake River sockeye salmon. Another commenter believed that, based on Lower Granite Dam passage data, the April 15 to June 15 Water Budget period adequately covers the bulk of the sockeye migration period. NMFS believes that these comments did not consider that the amount of water available may be insufficient to provide for outmigrants during the full 60-day window. A commenter's analysis on the adequacy of a 60-day migration window also failed to account for the considerable distances that Snake River sockeye salmon migrate in-river, both before arriving at, and after leaving, Lower Granite Dam.

Some commented that the Snake River simply does not have enough water under present conditions to provide needed fish migration flows. These commenters stressed the need to consider changes in the operation of the mainstem Snake River reservoirs. One commenter suggested that the current Water Budget provides adequate flows "in most years." As evidence, the commenter cited the report, "The Migrational Characteristics of Chinook Salmon Emanating from the Snake River Basin" by Dr. Albert E. Giorgi, submitted to the Pacific Northwest Utilities Conference Committee (PNUCC), dated April 11, 1991. NMFS reviewed this report but found neither this specific conclusion nor the data to support it. It is also significant to note that the May 9, 1991, comments of the PNUCC, for whom the report was prepared, stated that "There is general agreement that some increased flows above the confluence with the Columbia would assist juvenile migration."

NMFS received comments that state regulatory mechanisms that do not manage harvest to protect Snake River sockeye salmon, do not require irrigation diversions to be screened, and effectively favor consumptive use of water over in-stream use for fish, were more of a cause of the Snake River sockeye's decline than indicated in the proposed rule. As summarized in this final rule, the result of both state and Federal regulatory and enforcement mechanisms has been the failure to protect the Snake River sockeye salmon. At this time, NMFS has not determined which factors contributed most significantly to the species' decline.

Other Factors

Manmade Factors—Artificial Propagation. One commenter questioned whether there was indirect evidence that artificial propagation had compromised the genetic integrity of Stanley Basin sockeye salmon. NMFS

notes that sporadic releases of exotic *O. nerka* stocks have been recorded in the Stanley Basin Lakes since 1921. Electrophoretic analysis of the existing Stanley Basin populations and the most likely donor stocks for these exotic releases are included in the Snake River sockeye salmon Administrative Record. This information was used by NMFS in the "proposed rule to list" and no new information was presented to alter the agency's conclusions.

Other Manmade Factors. Some commenters pointed out that the proposed rule ignored the poisoning of certain Stanley Basin lakes and the erection of migration barriers to adult sockeye salmon to promote recreational trout fishing. These actions were alleged to have caused a significant decline in Snake River sockeye salmon. NMFS believes that the construction of migration barriers reduced the available habitat for Snake River sockeye salmon and has added this to the final rule.

Available Conservation Measures

Some commenters were concerned that the benefits of juvenile fish transportation are uncertain, and that it may actually reduce returns to spawning areas. In addition, one commenter cited 1984–86 studies of sockeye salmon transport from Priest Rapids and Wanapum dams to below Bonneville Dam as evidence that transported sockeye returned at lower rates than control fish released at Priest Rapids and Wanapum dams. As stated in the proposed listing, NMFS believes these studies were inconclusive. Other commenters were concerned that NMFS did not adequately consider the benefits of juvenile fish transportation. They felt that much of the information on the in-river losses of juvenile fish during migration was irrelevant because nearly all Snake River sockeye salmon are collected and transported. NMFS agrees that the uncertainty of transport benefits will need to be addressed. Whether it is as a result of, or in spite of, the existing juvenile fish transportation program, the fact remains that the Snake River sockeye salmon population has continued to decline.

Several commenters were concerned that critical habitat has not been designated. NMFS is not designating critical habitat concurrently with this listing because NMFS does not want to delay this listing decision while the required analyses for designating critical habitat are completed. NMFS intends to propose critical habitat in a separate rulemaking.

Consideration of Snake River Sockeye Salmon as a "Species" Under the ESA

To consider the Snake River sockeye salmon for listing, it must qualify as a "species" under the ESA. The ESA defines a "species" to include any "distinct population segment of any species of vertebrate * * * which interbreeds when mature." Concurrent with this final determination on sockeye, NMFS is publishing its final policy on how it will apply the ESA "species" definition in evaluating Pacific salmon (see "Notice of Policy on Applying the Definition of Species Under the Endangered Species Act to Pacific Salmon" in this issue of the Federal Register. A salmon population will be considered a distinct population, and hence a species under the ESA, if it represents an evolutionarily significant unit (ESU) of the biological species. The population must satisfy two criteria to be considered an ESU: (1) It must be substantially reproductively isolated from other conspecific population units; and (2) it must represent an important component in the evolutionary legacy of the biological species. Further guidance on application of this policy is contained in the NMFS paper "Pacific Salmon and the Definition of Species under the Endangered Species Act" (Waples In press).

In this case, the question of population distinctness is complicated by the presence of kokanee salmon in Redfish Lake. One hypothesis is that the sockeye and kokanee salmon share a common gene pool. If so, they should be considered as a unit in ESA evaluations. If the two forms are reproductively isolated, they should be considered separately.

Adult salmon returning to Redfish Lake were not available for comparison (genetic analyses) with spawning kokanee sampled from Fishhook Creek, an inlet stream to Redfish Lake in 1990. However, other evidence suggests that the two forms are distinct (Waples *et al.* 1991). Recent studies of *O. nerka* in other areas of the Pacific Northwest (Foote *et al.* 1989) found substantial genetic differences between the two forms, in spite of occasional cross-spawning behavior and viability of hybrids through early life-history stages in culture. Foote *et al.* (1989) found significant differences in the frequencies of alleles between sockeye and kokanee salmon in each of the lake systems they studied, and also found that the magnitude of genetic divergence between sympatric sockeye and kokanee salmon increased with distance upriver from the ocean. A recent electrophoretic survey conducted by NMFS also found substantial genetic differences between sockeye and kokanee salmon in two river/lake systems where they co-occur (Monan 1991). Thus, it is likely that, historically, sockeye and kokanee salmon were reproductively isolated in Redfish Lake. This premise is supported by recent evidence that outmigrants from Redfish Lake in 1991 were genetically distinct from Redfish Lake kokanee sampled last year (Schiewe 1991). Further evidence of reproductive isolation is that kokanee continue to spawn in an inlet stream (Fishhook Creek) in August/September, but sockeye salmon spawn later (generally October) and only along shoals in the lake (Bjornn *et al.* 1968; Fulton 1970; Bowler 1990).

An alternative hypothesis, that Sunbeam Dam caused the extinction of the original sockeye salmon gene pool and that recent anadromous *O. nerka* in Redfish Lake have resulted from the seaward drift of kokanee, was also considered (see discussion under "Status of Snake River Sockeye Salmon" below). Although it is known from studies in other geographical areas that kokanee can occasionally produce anadromous fish, the number of outmigrants that successfully return as adults is typically quite low. Furthermore, investigations of kokanee elsewhere have not included migration requirements, passage obstacles, or habitat limitations similar to those experienced by anadromous fish returning to the Snake River system. Thus, if kokanee were responsible for post-Sunbeam Dam anadromous *O. nerka* in Redfish Lake, it would be an unprecedented occurrence for the species (Waples *et al.* 1991).

Considering evidence that sockeye salmon continued to pass Sunbeam Dam prior to its removal, available genetic information, and given the uncertainty regarding the ability of Redfish Lake kokanee to produce anadromous *O. nerka* in the numbers observed, NMFS is proceeding on the premise that the original sockeye salmon gene pool still exits in Redfish Lake and is distinct from the kokanee (Waples *et al.* 1991).

Available information indicates that Snake River sockeye salmon are also reproductively isolated from other sockeye salmon populations and represent an important component in the evolutionarily legacy of the species. The great distance (over 700 river miles (1,127 kilometers)) separating Redfish Lake from the nearest sockeye salmon populations in the upper Columbia River ensures a strong degree of reproductive isolation. There is no evidence of straying of sockeye salmon from the

upper Columbia River or elsewhere into Redfish Lake (Waples *et al.* 1991).

Redfish Lake supports the world's southernmost natural sockeye salmon population. Sockeye salmon returning to Redfish Lake also travel a greater distance from the sea (almost 900 miles (1,448 kilometers)) and to a higher elevation (6,500 feet (1,219 meters)) than do sockeye salmon anywhere else in the world. In contrast, sockeye salmon in the upper Columbia Basin spawn at elevations more than 4,000 feet (1,219 meters) lower. Furthermore, the upper Columbia River populations are in a different ecoregion domain (humid temperate) than is Redfish Lake (dry) (Waples *et al.* 1991). Collectively, these data argue strongly for the ecological uniqueness (with respect to sockeye salmon) of the Snake River habitat and make it likely that the Redfish Lake population contains unique adaptive genetic characteristics.

Electrophoretic studies of sockeye salmon throughout North America and Asia typically have found substantial genetic differences between sockeye salmon stocks from different river systems (e.g., Utter *et al.* 1984; Foote *et al.* 1989; Monan 1991). Furthermore, a recent study (Monan 1991) demonstrated that samples of kokanee from Redfish and Alturas Lakes are genetically similar to each other but quite distinct from samples from other lakes in Idaho, Washington, and British Columbia. Although specific data are not available for Redfish Lake sockeye salmon, these results suggest that this population is probably genetically distinct from other sockeye salmon populations.

NMFS concludes that the best available information indicates that this population meets both of the criteria necessary to be considered an ESU. Therefore, NMFS has determined that the Snake River sockeye salmon is a "species" under the ESA.

Status of the Snake River Sockeye Salmon

Historically, sockeye salmon were produced in Idaho in the Stanley Basin of the Salmon River in Alturas, Pettit, Redfish, Yellowbelly and Stanley Lakes and may have been present in one or two other Stanley Basin lakes (Bjornn *et al.* 1968). Welsh *et al.* (1965) also included Little Redfish Lake, on Redfish Creek downstream from Redfish Lake, as sockeye salmon habitat. Outside of the Salmon River Basin, but within the Snake River Basin, sockeye salmon were produced in Big Payette Lake on the North Fork Payette River and in Wallowa Lake on the Wallowa River (Evermann 1895; Toner 1960; Bjornn *et al.* 1968, Fulton 1970).

In 1881, 2,600 pounds (1,180 kilograms) of fresh sockeye salmon were taken by prospectors at Alturas Lake, near Redfish Lake in the Stanley Basin (Evermann 1896). Agricultural diversions of water from Alturas Lake Creek currently prevent adult sockeye salmon from migrating upstream, precluding production in Alturas Lake. Treatment with piscicides (chemicals used to kill fish) in 1961 and 1962 and the construction of migration barriers to prevent the immigration of warmwater fish species precluded sockeye salmon production in Pettit, Stanley and Yellowbelly Lakes.

There is no reliable information on the numbers of sockeye salmon spawning in Redfish Lake in the early 1900s (Bjornn *et al.* 1968). However, Evermann (1895, 1896) reported that there were plans to build a cannery there.

Construction a Sunbeam Dam in 1910, 20 miles (32.2 kilometers) downstream from Redfish Lake Creek on the mainstream Salmon River, seriously impeded sockeye salmon access to the Stanley Basin lakes. The original adult fishway was constructed with wood and was ineffective in passing fish over the dam (Kendall 1912; Gowen 1914). It was replaced in 1920 with a concrete adult fishway that successfully passed sockeye salmon during at least 1 year.

There is a difference of opinion regarding the effects of Sunbeam Dam on the original sockeye salmon run to lakes in the Stanley Basin. Some argue that the dam represented a complete barrier to upstream passage for enough years that the original anadromous run was eliminated (Chapman *et al.* 1990). On the other hand, eyewitness accounts (Jones 1991) document adult sockeye salmon spawning in Redfish Lake in a number of years prior to and immediately after partial removal of the dam in 1934. Subsequently, Parkhurst (1950) reported sockeye salmon spawning in the lake in 1942.

Escapement of sockeye salmon to the Snake River has declined dramatically in recent years. Counts made at Lower Granite Dam (the first dam on the Snake River downstream from the confluence of the Salmon River) have ranged from 531 in 1976 to zero in 1990. It should be noted that the number of fish counted at a dam may differ from the number actually passing; some fish may pass during non-counting periods or may pass through navigation locks. Records are available on escapement into Redfish Lake for the years 1954 through 1966 and from 1985 through 1987. During these years, the Idaho Department of Fish and Game (IDFG) enumerated adult sockeye salmon at a weir in Redfish Lake Creek. In the years from 1954 through 1966, the number of adults counted by IDFG varied from 4,361 and 1955, to 11 in 1961, to 335 in 1964. In the years 1985 through 1987, IDFG operated a temporary weir in Redfish Lake Creek. The total escapement in these years was 12 in 1985, 29 in 1986, and 16 in 1987. In 1988, IDFG also conducted spawning-ground surveys in Redfish Lake and identified four adults and two redds (gravel mounds in which the eggs are deposited). In 1989, observations in Redfish Lake included one adult sockeye, one redd and a second potential redd. No redds or adults were observed in 1990.

During the spring of 1991, a fraction of the juvenile *O. nerka* outmigrants from Redfish and Alturas Lakes were collected and transported to Eagle Hatchery, Eagle, Idaho, to provide a potential source of broodstock for future sockeye production. Four adults (three males and one female) returned to Redfish Lake in 1991 and were captured and held in special facilities at Sawtooth Hatchery near Redfish Lake. These fish were successfully spawned and the resulting progeny will be used to maximize sockeye production.

Summary of Factors Affecting the Species

The ESA requires a determination of whether a species is threatened or endangered because of any of the five factors identified in section 4(a)(1). This determination is based on the "Summary of Factors Affecting the Species" section in the proposed rule and on comments received on the proposed rule. A brief description of these factors follows.

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Hydropower development has resulted in blockage of habitat, turbine-related mortality of juvenile fish, increased delay of juvenile migration through the Snake and Columbia Rivers, increased predation on juvenile salmon due to residualism in reservoirs and increased predator populations due to ideal foraging areas created by impoundments, and increased delay of adults on their way to spawning grounds. Water withdrawal and storage and irrigation diversions and blockage of habitat for purposes such as agriculture have also contributed to the destruction of Snake River sockeye salmon habitat.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Data specific to the exploitation of Snake River sockeye salmon are limited, but available information indicates that commercial fisheries in the lower Columbia River, and harvest on the spawning grounds, were primary factors in the decline of Snake River sockeye salmon (Fulton 1970).

The recreational harvest of sockeye salmon in the Columbia River is negligible (Washington Dept. of Fisheries and Oregon Dept. of Fish and Wildlife 1990). There is no information available to indicate that ocean harvest of Columbia River (including Snake River) sockeye salmon is significant.

C. Disease or Predation

Sockeye salmon are exposed to numerous bacterial, protozoan, viral, and parasitic organisms in spawning and rearing areas, migratory routes, and the marine environment. Even though *O. nerka* is susceptible to these, their effect on Snake River sockeye salmon is not documented.

Predators, particularly northern squawfish, *Ptychocheilus oregonensis*, and avian predator populations have increased due to hydroelectric development that created impoundments providing ideal foraging areas. Turbulent conditions in turbines, dam bypasses, and spillways have increased predator success by stunning or disorienting passing juvenile salmon migrants.

Marine mammal numbers, especially harbor seals and California sea lions, are increasing on the West Coast and increases in predation by pinnipeds have been noted in all Northwest salmonid fisheries. However, the extent to which predation is a factor causing the decline of Snake River sockeye salmon is unknown.

D. Inadequacy of Existing Regulatory Mechanisms

A wide variety of Federal and state laws and programs have affected the abundance and survival of anadromous fish populations in the Columbia River. These regulatory mechanisms have not prevented the decline of Snake River sockeye salmon.

E. Other Natural and Manmade Factors

1. Natural Factors. Drought is the principal natural condition that may have contributed to reduced Snake River sockeye salmon production. Annual mean streamflows for the 1977 water year were generally the lowest recorded for many streams since the late nineteenth century (Columbia River Water Management Group 1978). The 1990 water year became the fourth consecutive year of drought conditions in the Snake River Basin (Columbia River Water Management Group—in press).

2. Manmade Factors. There is no direct evidence that artificially propagated fish have compromised the genetic integrity of Stanley Basin sockeye salmon. Supplementation of kokanee salmon occurred sporadically, beginning early in this century. In most cases, the origin of the donor stocks is unknown (Bowler 1990). Preliminary electrophoretic analyses of 19 different sockeye and kokanee salmon samples from Idaho, Washington, and British Columbia (these include the most likely sources for donor stocks) indicated that Redfish and Alturas Lake kokanee populations are genetically different from the other populations sampled. Adult salmon returning to Redfish Lake were unavailable for sampling. Artificial production of other species may have an adverse impact on Snake River sockeye salmon as they jointly migrate through the rivers, estuary and ocean, and may compete with sockeye salmon for food.

Determination

Based on its assessment of available scientific and commercial information, NMFS is issuing a final determination that the Snake River sockeye salmon (*Oncorhynchus nerka*) is a "species" under the ESA and should be listed as endangered under the ESA.

Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the ESA include recognition, prohibitions on taking, recovery actions, and Federal agency consultation requirements. Recognition through listing promotes conservation actions by Federal and state agencies and private groups and individuals.

For listed species, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or conduct are not likely to jeopardize the continued existence of a listed species or to destroy or adversely modify its critical habitat. If a Federal action may adversely affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with NMFS.

Examples of Federal actions most likely to affect Snake River sockeye salmon include authorized purposes of mainstem Columbia and Snake Rivers hydroelectric and storage projects. Such authorized purposes include hydroelectric power generation, flood control, irrigation, and navigation. Federal actions including COE section 404 permitting activities under the Clean Water Act, COE section 10 permitting activities under the Rivers and Harbors Act, and FERC licenses for non-Federal development and operation of hydropower may also be affected.

Critical Habitat

NMFS has completed its analysis of the biological status of sockeye salmon in the Snake River but has not completed the analysis necessary for the designation of critical habitat. NMFS has decided to proceed with the final listing determination now and to proceed with the designation of critical habitat in separate rulemaking. NMFS believes that this action is consistent with the intent of the 1982 amendments to the ESA: "The Committee feels strongly, however, that, where the biology relating to the status of the species is clear, it should not be denied the protection of the Act because of the inability of the Secretary to complete the work necessary to designate critical habitat." H. Rep. No. 567, 97th Cong., 2d Sess. 19 (1982).

NMFS has determined that final listing is appropriate and necessary to the conservation of Snake River sockeye salmon. The prompt listing will bring the protections of the ESA into force, including the requirement that all Federal agencies consult with NMFS to ensure their actions are not likely to jeopardize the continued existence of the species. Prompt listing will assure that Federal agencies whose activities may affect the species will consult with NMFS under section 7(a)(2) of the ESA during their planning for 1992 operations and activities. For example, the Corps of Engineers is currently analyzing potential options for 1992 to improve river flows for salmon and the Bonneville Power Administration is preparing a review of Columbia and Snake River hydropower operation. Listing now will thus promote timely and effective consideration of measures to conserve Snake River sockeye salmon.

Furthermore, NMFS has concluded that critical habitat is not determinable at this time because information sufficient to perform the required analysis of the impacts of the designation is lacking. Designation of critical habitat requires a determination of those physical and biological features that are essential to the conservation of the species and which may require special management considerations or protection. NMFS has been reviewing scientific and biological information

concerning the habitat requirements of Snake River sockeye salmon and has been identifying activities that may adversely impact the habitat. This will take additional time because many Federal and State agencies are involved in the management of fish and wildlife habitat in the Columbia River system. Further, management considerations and protection for sockeye salmon are complicated by the possibility that these measures, if developed in isolation, may not be appropriate for other Snake River salmon species. Thus, NMFS is planning to propose concurrently critical habitat determinations for all petitioned Snake River salmon stocks. In addition, designation of critical habitat requires the consideration of economic information. NMFS is in the process of gathering and analyzing the economic information needed for the designation (see notices requesting information on critical habitat published in the Federal Register on October 15, 1991; 56 FR 51684).

Classification

The 1982 amendments to the ESA (Pub. L. 97-304) in section 4(b)(1)(A), restricted the formation that may be considered when assessing species for listing. Based on this limitation of criteria for a listing decision and the opinion in *Pacific Legal Foundation* v. *Andrus*, 657 F.2d 829 (6th Cir., 1981), NMFS has categorically excluded all endangered species listings from environmental assessment requirements of the National Environmental Policy Act (48 FR 4413, February 6, 1984).

The Conference Report on the 1982 amendments to the ESA notes that economic considerations have no relevance to determinations regarding the status of species, and that E.O. 12291 economic analysis requirements, the Regulatory Flexibility Act, and the Paperwork Reduction Act are not applicable to the listing process. Similarly, listing actions are not subject to the requirements of E.O. 12612.

References

The complete citations for the references used in this document can be found in the Proposed Endangered Status for Snake River Sockeye Salmon (56 FR 14055; April 5, 1991) or one of the following:

Schiewe, M.H. 1991. Genetic Studies of Redfish Lake Outmigrants *Oncorhynchus nerka*. Memorandum to Rolland Schmitten and Richard Berry dated July 19, 1991.

Waples, R.S. In press. Pacific Salmon and the definition of "Species" under the Endangered Species Act. Marine Fisheries Review.

Waples, R.S., O.W. Johnson, and R.P. Jones, Jr. 1991. Status Review Report for Snake River Sockeye Salmon. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-195.

List of Subjects in 50 CFR Part 222

Administrative practice and procedure, Endangered and threatened wildlife, Exports, Fish, Imports, Marine mammals, Reporting and recordkeeping requirements, Transportation.

Dated: November 14, 1991.

William W. Fox, Jr.,

Assistant Administrator for Fisheries.

For the reasons set out in the preamble, 50 CFR part 222 is amended as follows:

PART 222—ENDANGERED FISH OR WILDLIFE

1. The authority citation for part 222 continues to read as follows:

Authority: 16 U.S.C. 1531 *et seq.*

§ 222.23 [Amended]

2. In § 222.23, paragraph (a) is amended by adding the phrase "Snake River sockeye salmon (*Oncorhynchus nerka*);" immediately after the phrase "Totoaba (*Cynoscian macdonaldi*);" in the second sentence.

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